

Abolishing user fees for children and pregnant women trebled uptake of malaria-related interventions in Kangaba, Mali

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Malaria is the most common cause of morbidity and mortality in children under 5 in Mali. Health centres provide primary care, including malaria treatment, under a system of cost recovery. In 2005, Médecins sans Frontières (MSF) started supporting health centres in Kangaba with the provision of rapid malaria diagnostic tests and artemisinin-based combination therapy. Initially MSF subsidized malaria tests and drugs to reduce the overall cost for patients. In a second phase, MSF abolished fees for all children under 5 irrespective of their illness and for pregnant women with fever. This second phase was associated with a trebling of both primary health care utilization and malaria treatment coverage for these groups. MSF's experience in Mali suggests that removing user fees for vulnerable groups significantly improves utilization and coverage of essential health services, including for malaria interventions. This effect is far more marked than simply subsidizing or providing malaria drugs and diagnostic tests free of charge. Following the free care strategy, utilization of services increased significantly and under-5 mortality was reduced. Fee removal also allowed for more efficient use of existing resources, reducing average cost per patient treated. These results are particularly relevant for the context of Mali and other countries with ambitious malaria treatment coverage objectives, in accordance with the United Nations Millennium Development Goals. This article questions the effectiveness of the current national policy, and the effectiveness of reducing the cost of drugs only (i.e. partial subsidies) or providing malaria tests and drugs free for under-5s, without abolishing other related fees. National and international budgets, in particular those that target health systems strengthening, could be used to complement existing subsidies and be directed towards effective abolition of user fees. This would contribute to increasing the impact of interventions on population health and, in turn, the effectiveness of aid.

Keywords User fees, malaria, children, pregnancy, health services, Mali

KEY MESSAGES

- In Mali, as in many other Sub-Saharan countries, essential health services are underused notably because of user fees.
- Subsidizing diagnostics and drugs alone for a prevalent disease such as malaria, without also abolishing general user fees, is less effective because subsidies remain trapped within the context of 'inaccessible' health facilities.
- It is only when a basic package of care was delivered free of charge to selected groups (pregnant women and under-5s) that confirmed and treated malaria cases trebled, revealing the huge unmet demand existing before abolition of user fees.
- Provision of a basic care package free-of-charge allowed a significant increase in utilization rates, which in turn allowed efficiency gains through better use of existing resources.
- Governments, donors and other health actors should integrate such evidence into their policy choices to guarantee adequate use of resources and to enhance the impact of interventions on public health.

Introduction

In many low-income countries, the targets of the health-related Millennium Development Goals (MDGs) are far off track (United Nations 2009). One of the main barriers to improving health in these contexts has been the presence of user fees that limit access to care and have adverse effects on health care utilization, especially for the poorest households (James *et al.* 2006). Evidence of exclusion from services and/or impoverishment as a result of user fees has been documented in a number of studies (Save the Children 2005; McIntyre *et al.* 2006). So too is the case related to the positive impact of user fee abolition in increasing health service utilization (Wilkinson *et al.* 2001; James *et al.* 2005; Nabyonga *et al.* 2005; Ridde and Morestin 2011). Many countries still rely on user fees for financing healthcare (WHO 2008) and donor support for abolition of user fees remains limited. More specific evidence on the effects of user fee abolition is still needed. (Palmer and Lagarde 2008; Morestin and Ridde 2009)

This paper brings evidence from a Médecins sans Frontières (MSF) project in Kangaba, in the south-east of Mali, on the impact of abolishing user fees on utilization of essential health services and mortality. We describe: (a) the process that led to user fee abolition including the additional resources and costs; (b) health care utilization rates before and after abolition of user fees; (c) trends in mortality.

Methods

Study setting and population

Malaria constitutes the main cause of mortality and morbidity in Mali, especially in children under the age of 5 years. On average, children under 5 suffer from two episodes of malaria per year, while those over 5 suffer from one per year (MOH 2007). Findings of high levels of resistance to some anti-malaria drugs in the country (De Radigues *et al.* 2006) and of high mortality rates—1.9 deaths in 10 000 persons per day for children under the age of 5, mainly due to malaria (MSF 2006)—led MSF to support a health care project in Mali. The project aimed at supporting the Malian health authorities to implement their newly adopted treatment protocol against malaria. (The change of protocol was decided in 2005 and formalized as national policy in 2006.) The MSF intervention started in August 2005 in Kangaba Circle in the Koulikoro

region, where the period May to October corresponds to the rainy season, which is associated with high malaria transmission. The project started in 7 out of 11 health centres and in the referral centre (for the inpatient department) within the Circle.

Mali is divided into Circles where community health associations (ASACOs) create and manage community health centres. The health centres are the first step in a health pyramid that provides an essential basic package of care; they use referral health centres as their primary reference. This system was set up at the beginning of the 1990s in the context of the Bamako Initiative (UNICEF 2008). The Ministry of Health (MOH) helps with the opening of these health centres (support for building, equipment and initial drug stocks) and generally assigns and pays a health centre chief. For the rest of the expenses, health centres are run according to cost-recovery mechanisms: users pay directly for their health care (drugs and medical acts). ASACOs manage the money collected from patient fees to buy drugs, pay some of the personnel and cover other operating costs. This is a quite unique situation in sub-Saharan Africa, with most of the first-level care services being privately managed and community-based but still subject to public planning and regulations (Audibert and Rodenbecke 2005).

The seven health centres included in the MSF project served an area with a total population of 66 500 people in 2005 and were located on the western side of the river Niger. This area we refer to in this paper as the 'intervention area'. The three health centres located on the eastern side of the river and serving a population of 27 000 people were not supported until September 2008. This area we refer to as the 'non-intervention area'.

In the intervention area, in 2005, MSF started supplying rapid diagnostic tests (RDTs) and artemisinin-based combination therapy (ACTs). All health personnel from the seven health centres were trained to the use of the new protocol and supervised as part of the routine supervision programme by joint MOH/MSF teams. Chloroquine was withdrawn from the health centres. MSF support also included training to community workers to increase the population's awareness on malaria prevention and treatment. Mosquito nets were distributed to children up to 1 year of age and to pregnant women during antenatal consultations. Likewise, pregnant women were administered intermittent preventive treatment for malaria from the second trimester of pregnancy onwards. Continuous training to reinforce quality of care at health centres and referral centre (for severe and complicated malaria) was conducted by

MSF teams. In July 2007, in addition to the support to the health centres, a malaria village worker network (corresponding to 2–3 malaria village workers per health centre catchment area) was set up to treat children up to 10 years old for simple malaria in remote areas with particularly difficult access during the rainy season. Malaria village workers had RDTs and ACTs available to treat children testing positive, and they referred severe cases and fever cases with negative RDT result to health centres.

In the non-intervention area, health centres worked with the regular Malian health system described above, and RDTs and ACTs were introduced in 2007.

Implementation of free care in the health centres

Before the MSF intervention, the seven health centres located in the intervention area provided primary care, including malaria treatment, as per the national system of cost recovery.

At the start of the project, in August 2005, MSF reduced the cost for patients by subsidizing malaria tests and drugs. RDTs and ACTs would be provided for free to children under 5 and would be sold at a flat fee of 85 XOF (0.13 EUR) for adults. For consultation, other treatments and diagnostic tests, user fees

were maintained. Records from the start of the project refer to user charges totals varying between 400 and 1000 XOF (0.6–1.5 EUR) for one episode of illness. This initial set up of the project is referred to in this paper as *Phase I* (see Figure 1).

In December 2006, MSF abolished all patient fees for all diseases for children under 5 (including consultation, diagnostic tests, treatments and referral). Pregnant women started to benefit from free care for all cases of fever (including consultation, tests, treatments and referral). User fees for other groups were reduced to a fixed sum of 200 XOF (0.3 EUR) for all cases of fever, including all expenses linked to an episode of illness. Severe and complicated malaria cases among children under 10 were referred to the referral centre and treated for free. For other pathologies, prices at health centres continued under the usual cost-recovery system. From July 2007 on, during the rainy season, malaria village workers also treated confirmed cases of malaria among children up to 10 free of charge. This changed set up of the project is referred to in this paper as *Phase II* (see Figure 1).

By providing health care free of charge as described above, health centres incurred a loss of revenue. As patient fees collected previously under the cost-recovery mechanism were used to cover running costs of the structures, under phase II

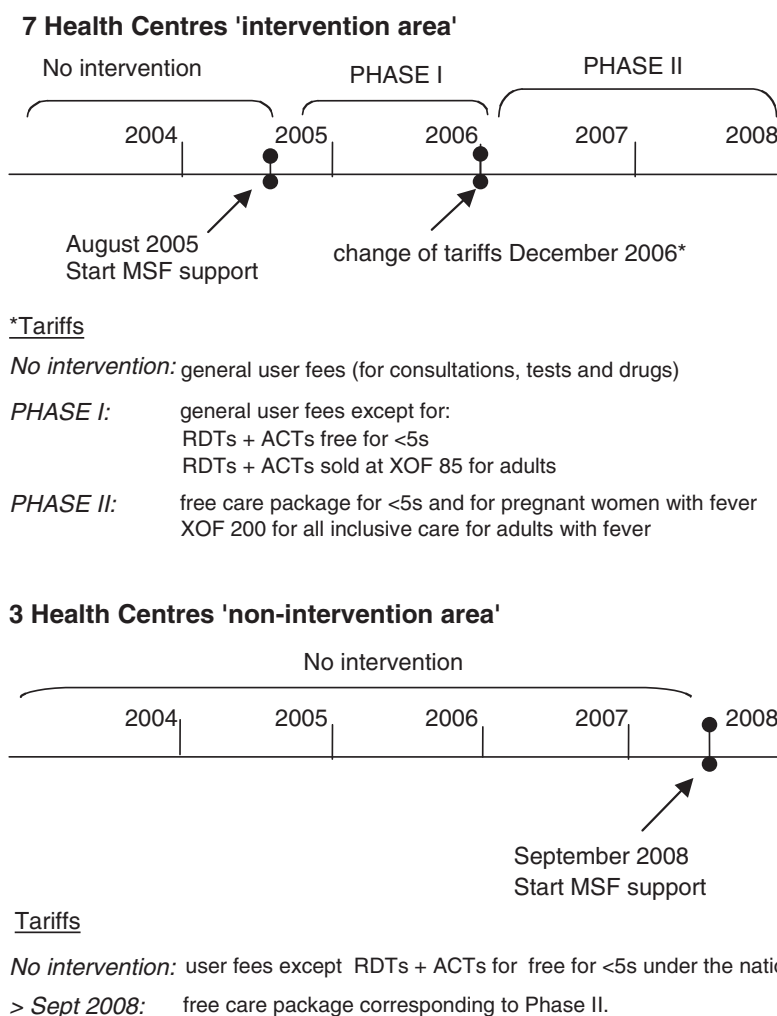


Figure 1 Evolution of tariffs in Kangaba health circle from 2004 to 2008

the revenues no longer obtained through patient fee collection had to be replaced from other financial sources. In line with MSF general project policy, MSF subsidized the existing system by paying instead of the patient. This guaranteed the continued availability of care and ensured that main expenditures related to running costs of the health centres were covered. Besides the supply of essential drugs by MSF, financial compensation was organized in the form of a monthly sum paid to the ASACOs, based on the number of staff, the average operating costs and the performance of each health centre. This sum served to cover the operating costs of the health centres, as well as the staff remuneration. Staff payments from this source covered fixed salaries for staff outside the MOH payroll and a complement calculated on the basis of the performance of the health centre, both quantitative (proportional to the monthly number of consultations) and qualitative. The same financial compensation also guaranteed transportation of patients to the referral centre and free treatment for those referred.

In the non-intervention area, the three health centres implemented cost-recovery. By mid 2007, RDTs and ACTs were declared free of charge for children under 5, according to the national policy. Other patient payments were maintained until the start of MSF support in September 2008.

Data and statistical analysis

Utilization of health services

For the intervention area, we used regular programme monitoring data. These data were recorded daily at health centre level and then aggregated to obtain monthly and annual indicators. Indicators used in the article were the number of new consultations recorded at the level of the health centres and the total number of malaria consultations. Utilization rates for the general population and for target groups (under-5s, over-5s and pregnant women) were then calculated based on the number of new consultations recorded and the population figures available for the catchment area of the health centres. We compared the total annual number of new consultations and the number of malaria cases from 2004 to 2008. The year 2004 corresponds to the period before the MSF intervention; 2005–06 corresponds to *Phase I* and 2007–08 to *Phase II* of the intervention.

For the non-intervention area, we used health centre records of the number of new consultations as noted in existing health centre registers. Utilization rates were calculated based on these data and were standardized in relation to the population of the catchment area of the health centres in the non-intervention area.

Mortality

In July/August 2008, MSF carried out two cross-sectional surveys measuring mortality in both intervention and non-intervention areas (MSF 2009). The surveys were carried out following recommended guidelines for two-stage cluster surveys (Checci and Roberts 2005; WHO 2005). Households were interviewed on their health-seeking behaviour for the last episode of fever among children up to 10 and on the possession of mosquito nets. Survey methodology is described in Box 1.

Costs

Data on costs of consultations are based on MSF and health centres' financial data, as well as on drug consumption data from health centres and orders to MSF. Data presented in this article cover all costs related to health centres, but do not include costs specifically related to MSF supervision teams (remuneration, housing, office space, transportation, security of these teams). Data refer to the first level of care (health centres) and do not include costs at the referral centre as the intervention was mainly focused on the primary care level. Costs were calculated based on a sample of 4 health centres that were representative of health centres in the area. Staff costs cover both salary and incentives costs, including malaria village workers remuneration. Overhead costs include maintenance costs, purchases below 500 EUR (motorbikes, bicycle etc.) and costs such as fuel, stationary and the health centre's contribution to costs to cover referral of patients to the referral centre.

Box 1 Mortality survey methodology used in Kangaba, Mali

Period of survey

- From 1 June 2007 (start of rainy season) till date of survey (July/August 2008).
- Average recall period: 407 days for non-intervention area and 422 days for intervention area.

Sample size

- Calculated to allow for comparison of mortality for children under 5 between intervention (estimated at 1/10 000/day) and non-intervention areas (estimated at 2/10 000/day) for a 1 year period.
- 40 clusters of 25 households in the intervention area.
- 60 clusters of 27 households in the non-intervention area.

Cluster distribution

- Clusters distributed into subsections corresponding to health zones and villages proportional to population size.

Choice of households

- 'Spinning the bottle' method (World Health Organization).

Survey teams

- Were recruited on the basis of their knowledge of the area and of the local language.
- Were trained and supervised by MSF.

Data analysis

- Mortality data were analysed using EPI info 6.04.

In addition, data on cost of care for the target group of under-5s—benefiting from a full free care package—were calculated on the basis of utilization of health services by under-5s in all health centres located in the intervention area in 2007 and on MSF and health centre data on costs associated with these consultations.

The comparison of costs during the period with MSF support and costs before intervention are based on data from two health centres, representative of the health centres of the area, comparing 2007 and 2005, both during low malaria transmission seasons. There were no other available data covering the period before the MSF intervention.

Results

Trends in health service utilization per inhabitant, in children and related to malaria

In 2004, before the MSF intervention, the health service utilization rate was at 0.17 new cases per inhabitant per year (NC/inh/year). During the first phase of the project, the utilization rate was 0.22 in 2005 and 0.29 in 2006. During the second phase of the project, in 2007, after abolishing fees for selected groups, utilization increased to 0.84 NC/inh/year, corresponding to a three times increase compared with 2006 when MSF subsidized tests and malaria drugs only. The increase was maintained throughout 2008 (see Figure 2).

For children under 5 years, the utilization rate increased progressively from 0.34 in 2004 to 0.45 in 2005 and 0.70 in 2006. In 2007, with free care, it increased to 2.86, corresponding to four times more children being treated compared with the first phase of the project (see Figure 3). The increase was sustained in 2008.

The utilization rate for curative care for pregnant women increased over the same period, from 0.07 in 2004 to 0.15 in 2005 and 0.31 in 2006. With free care for all pregnant women presenting with fever, it increased to 1.12 in 2007 and 1.17 in 2008, corresponding to 3.5 more pregnant women treated for fever (see Figure 3).

For the population over 5, still paying a flat fee, utilization rates increased but much less than for the groups benefiting from free care. They did not go above 0.42 NC/inh/year (see Figure 3).

The overall number of malaria cases treated in health centres increased from 5104 in 2004, to 6644 in 2005 and 8169 cases in 2006. In 2007, after abolishing fees, it increased to 18 483 malaria cases treated in health centres and 25 642 treated in total (health centres and malaria village workers). In 2008, 29 916 malaria cases were treated in total (see Figure 4). For children under 5, the number of malaria cases treated per child per year increased from 0.18 in 2004 to 0.26 in 2005 and 0.38 in 2006. In 2007, 1.28 malaria cases were treated per child per year, corresponding to a better coverage compared with the 2 expected cases of malaria per child per year. This improved coverage was maintained in 2008 (see Figure 5). For adults, who were still paying a flat fee, the number of malaria cases treated per person per year remained well below the expected malaria rate of 1 case per person per year (0.12 in 2007 and 0.16 in 2008).

In the non-intervention area, utilization of services did not vary greatly between 2004 and 2007. In the intervention area, free care implementation led to a trebling of utilization in 2007 (see Figure 6). This shows that important increases in utilization rates in the intervention area were not linked to other factors in the environment, but most likely to the change in strategy in terms of access to care. Data also confirmed that the increase in utilization in the intervention area was not linked to

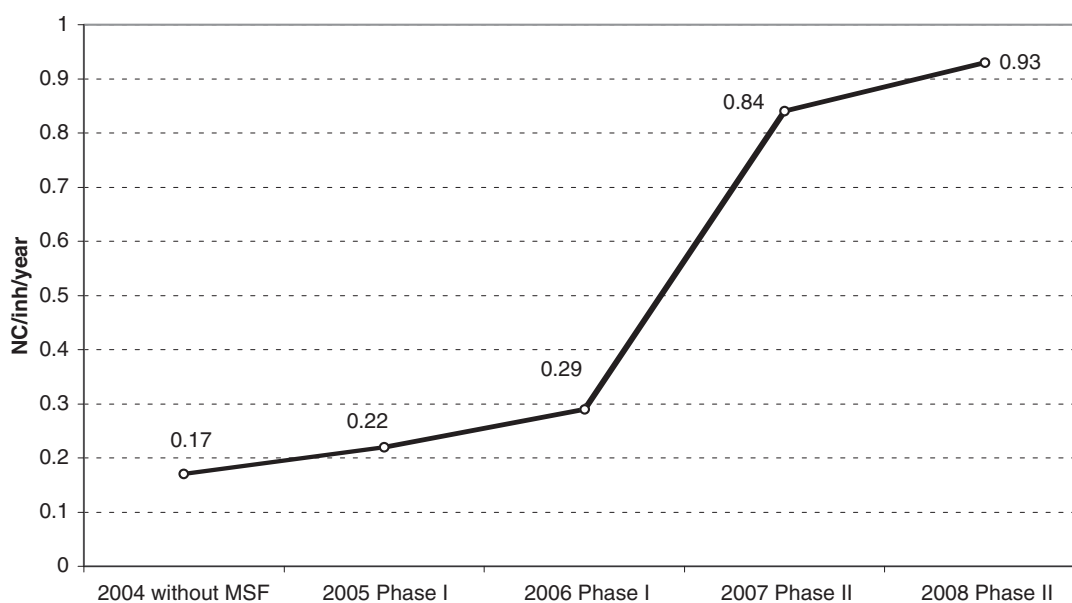


Figure 2 Trends in health services utilization in the intervention area, Kangaba, Mali, 2004–2008 Note: NC/inh/year = new cases per inhabitant per year.

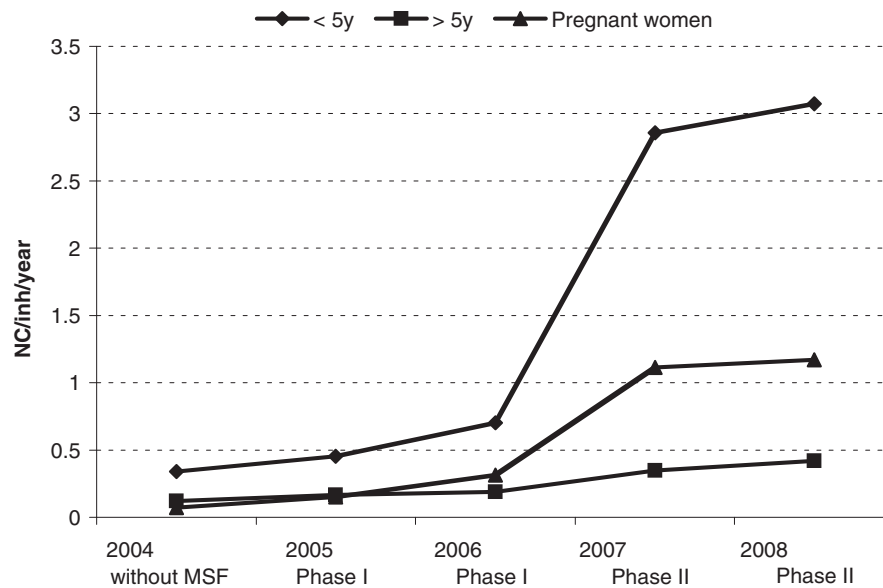


Figure 3 Trends in health services utilization per target group in the intervention area, Kangaba, Mali, 2004–2008 Note: NC/inh/year = new cases per inhabitant per year.

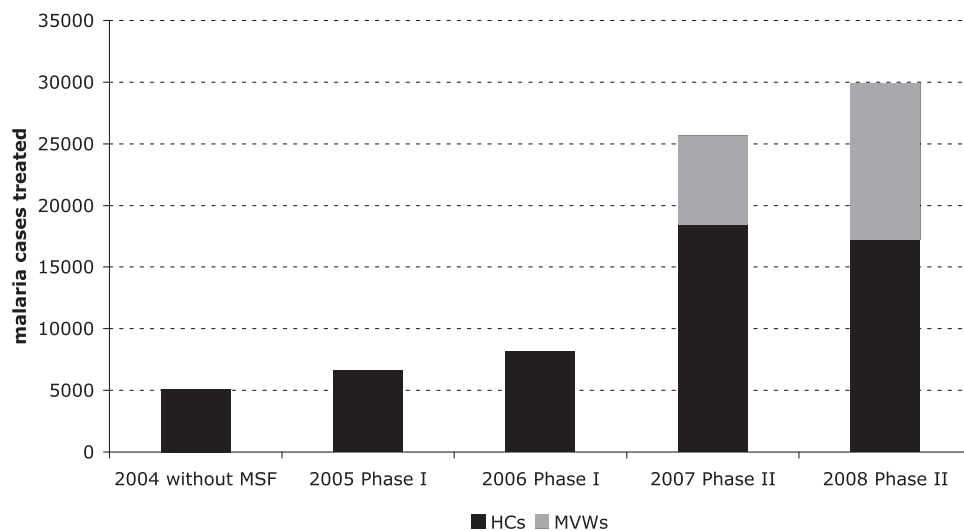


Figure 4 Trends in health services utilization for confirmed malaria cases in the intervention area, Kangaba, Mali, 2004–2008 Notes: HC = health centre; MVW = malaria village worker.

a leakage of patients from the non-intervention area where utilization rates remained stable and low.

Results from the 2008 survey (MSF 2009) of the intervention and non-intervention areas also revealed different health-seeking behaviour between the zones in cases of fever among children up to 10. In the intervention area, the use of formal health structures, as a first recourse, was significantly higher than in the non-intervention area. In the non-intervention area, 40.1% of households used alternative care compared with 17.3% in the intervention area (see Table 1). In the non-intervention

area, 80.2% (CI: 73.8–86.5) of households reported using alternative care because of lack of money compared with 26.9% (18.8–34.9) in the intervention area. Significant differences between intervention and non-intervention areas were also found when singling out the group of households interviewed within a maximum distance of 5 km around a health centre (commonly called ‘zone A’ in Mali) and the group of households living further away from a health centre (‘zone B’), revealing that money was a major blocking factor both for people living close to a health centre and for those living further away.

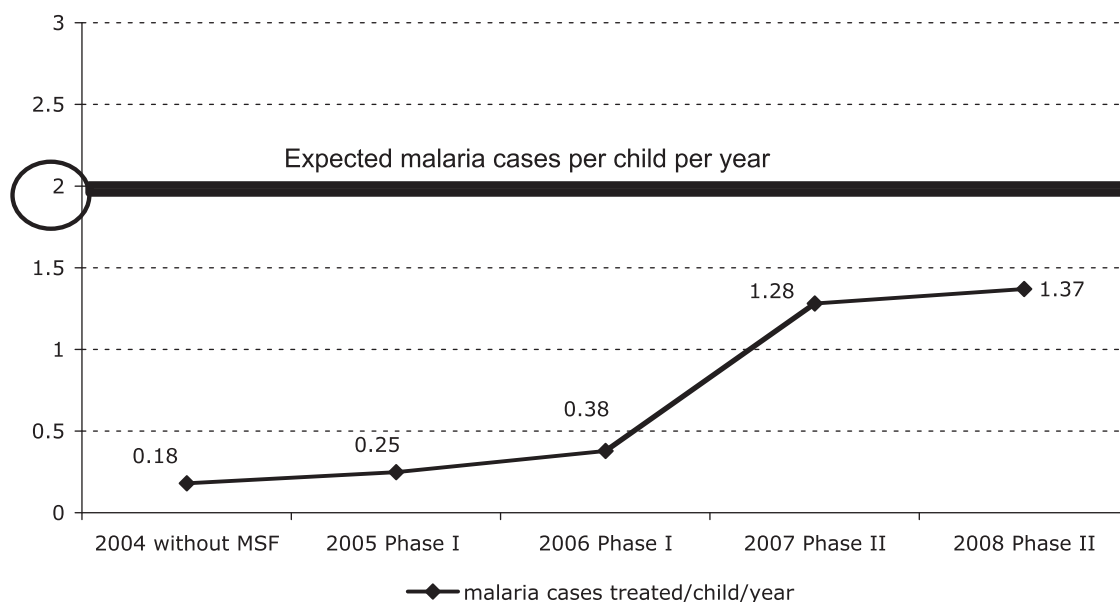


Figure 5 Trends in number of confirmed malaria cases treated per child per year in the intervention area, Kangaba, Mali, 2004–2008

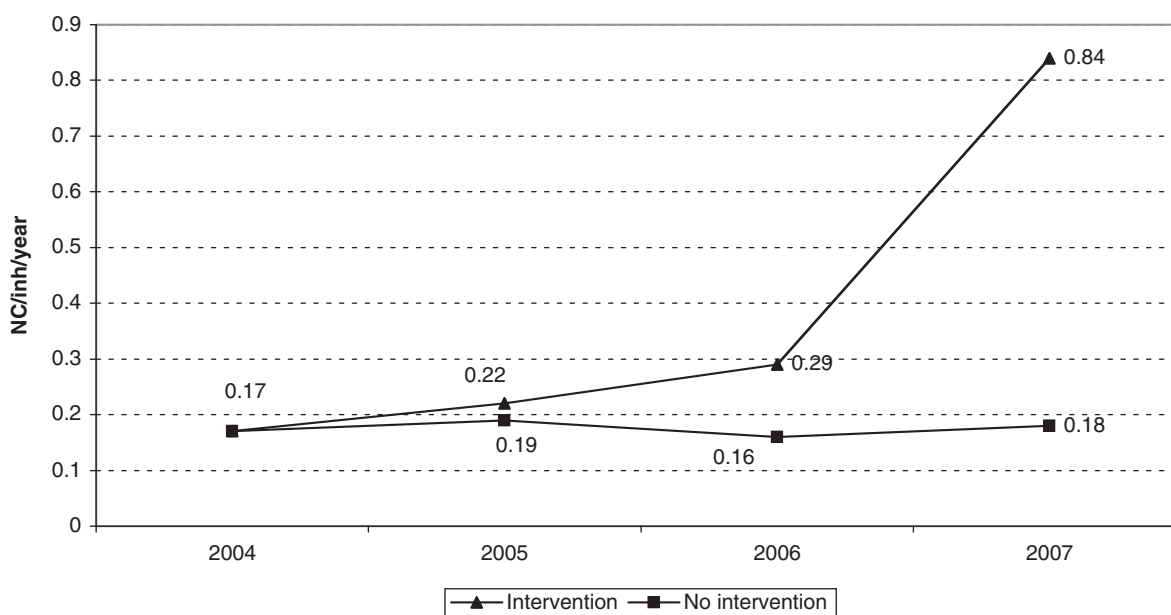


Figure 6 Trends in health services utilization in the intervention area and non-intervention area, Kangaba, Mali, 2004–2007.

Note: NC/inh/year=new cases per inhabitant per year

Trends in mortality

Results from the mortality survey carried in 2008 (MSF 2009) revealed that in the intervention area, crude and under-5 mortality rates were half of those in the non-intervention area, with statistically significant differences (see Table 2). Mortality for under-5s in the non-intervention area was above the expected rate in a stable context (Checci and Roberts 2005).

Significant differences in health-seeking behaviour between the two areas were found in the surveys (see Table 1), with access indicators explaining at least in part the differential mortality between the two areas. The surveys also showed

significant differences in the number of mosquito nets per household between the two areas surveyed. However, we found no significant difference in the average number of mosquito nets per household between households with at least one death reported and households with no death reported during the period considered.

Resources and costs associated with care offered free of charge

In the intervention area, in 2007, average cost of care per 1000 consultations at health centres corresponded to 2370 EUR.

Table 1 Health seeking behaviour for intervention and non-intervention areas, Kangaba, Mali

	Household use of health care providers in case of fever	
	Intervention area	Non-intervention area
Percentage using formal health structures [95% CI]	82.7 [76.6 – 88.8]	59.9 [52.9 – 67.0]
Percentage using alternative care [95% CI]	17.3 [11.2 – 23.4]	40.1 [33.0 – 47.1]
Proportion of households using alternative care due to lack of money [95% CI]	26.9 [18.8 – 34.9]	80.2 [73.8 – 86.5]

Notes: Formal health structures include: health centres and malaria village workers, referral centre.

Alternative care includes: traditional healers, drug pedlars, private pharmacies and other non-regulated alternatives.

Table 2 Mortality rates for intervention and non-intervention areas, Kangaba, Mali

	Mortality (deaths/10 000/day)	
	Intervention area	Non-intervention area
Crude mortality rate [95% CI]	0.21 [0.16 – 0.27]	0.44 [0.37 – 0.51]
Under-5 mortality rate [95% CI]	0.71 [0.43 – 0.99]	1.47 [1.23 – 1.72]

Notes: For stable population: crude mortality rate (CMR) is estimated at 0.5/10 000/day.

Emergency threshold: CMR \geq 1/10 000/day.

Under-five mortality rate (U5MR): assumed baseline 1/10 000/day.

Emergency threshold: U5MR \geq 2/10 000/day.

Drugs represented 55% of health centres costs, staff-related costs 32% and operating costs 13%. Average cost of consultation for under-5s at a health centre and calculations on cost per child per year are presented in Table 3.

Compared with available data for 2005 (prior to intervention), health centre costs per 1000 consultations were 20% lower in 2007. This is reflected particularly in staff expenses that were reduced by 32% and operating costs that were reduced by 51% (see Table 4). These reductions are the consequence of economies of scale: in the period, the number of consultations was multiplied by more than 2 while staff expenses increased by 140% due to increases in salary and in staff (see Table 5) and operating expenses were constant. After the MSF intervention, staff expenses were optimized with a workload of 14 patients/medical staff/day (during low transmission) instead of four as previously.

Discussion

Results from the Kangaba project show that without the delivery of a completely free care package for vulnerable groups, effective interventions against malaria remained inaccessible to many. Providing proper malaria care with effective drugs and

Table 3 Health care costs for children under 5 benefiting from a full free care package at health centres, intervention area, Kangaba, Mali, 2007

	Low malaria transmission season	High malaria transmission season
Cost per consultation <5 (EUR)	2.11	1.94
Utilization <5 (NC/inh/year)	0.93	1.92
Cost per child <5 per season (EUR)	1.9	3.7
Cost per child <5 year (EUR)		5.6

Note: NC/inh/year = new cases per inhabitant per year.

Table 4 Health care costs for all curative consultations before (2005) and after (2007) the introduction of free care for target groups in the intervention area, Kangaba, Mali

	2005 (EUR)	2007 (EUR)
Cost per 1000 consultations	3560	2940
Costs per 1000 consultations include:		
Drug costs	1280	1280
Personnel costs	1600	1210
Operating costs	680	450

Table 5 Personnel costs for all curative consultations before (2005) and after (2007) the introduction of free care for target groups in the intervention area, Kangaba, Mali

	2005	2007
Salaries (EUR)	2840	6903
Number of consultations	1779	5705
Cost per 1000 consultations (EUR)	1600	1210
Number of consultations/day/staff	4	14

diagnostics is not enough nor effective if this is isolated from free care at the health centre level. We found that the strategy of targeting too narrowly (subsidizing tests and drugs only) was self-defeating. Conversely, a broader strategy of removing all financial barriers at the point of use for large groups such as children under 5 increased uptake of essential health care, including for confirmed malaria cases.

The main strengths of this paper are that: (1) the pilot project is largely based on existing health centres and largely uses health centre personnel already in place, which reinforces the potential for scaling up at national level; (2) the systematic use of RDTs to confirm malaria fostered rational malaria treatment; (3) it combines health centre and population data, giving a global picture of health-seeking behaviour, not only for those using health centres; (4) the data allowed comparison of results in terms of utilization between provision of free diagnostics and drugs—corresponding to the national policy—and provision of a basic package of free care, with the rest of the support being largely unchanged; (5) mortality trends in two areas of the same Circle but with different support give an indication of the impact on population health status of different health strategies.

There are, however, a number of limitations:

- (1) Health centre data are based on a before–after study in an open environment which is subject to the usual limitations of any observational study;
- (2) Mortality data prior to intervention are not available. However, prior mortality surveys in other districts with a similar epidemiological profile and health care coverage revealed high mortality rates for under-5s, with the majority linked to reported fever episodes (MSF 2006);
- (3) No detailed figures are available for specific utilization rates (malaria, per target group) in health centres located in the non-intervention area;
- (4) Costing data covering the period before intervention are limited to two out of seven health centres only. However, based on the available data for the intervention period, we observed that the cost analysis for these two health centres was similar and thus representative of other health centres in the Kangaba Circle;
- (5) The paper focuses on the impact of user fee abolition on the utilization of care. It does not investigate other obstacles to care than user fees, such as indirect costs and non-cost-related barriers.

These limitations notwithstanding, the findings of this project raise a number of arguments that merit discussion.

Impact on health service utilization

MSF experience in Kangaba shows that to have a significant impact on coverage of malaria treatment, working on the quality of care and subsidizing diagnostics and drugs while maintaining other costs for patients is not effective and compromises the overall impact. While costs to patients for consultation and non-malaria treatment were maintained in 2005 and 2006, utilization of general care and for malaria increased but many people were still not using health centres—even with the improved availability of effective drugs and tests and a reinforced technical supervision of health staff provided by MSF. These results reveal that improved quality of care did not mitigate the negative impact of fees, contrary to what has been found in earlier studies (Nyonator and Kutzin 1999; Audibert and Mathonnat 2000). Although it is commonly agreed that offered and perceived quality is an important determinant of health-care seeking, on its own it will not be sufficient in contexts of widespread poverty to allow patients to use essential health services when they need them. In Kangaba, the financial factor blocked many patients from accessing essential care. Similar results were found in a recent study in Ghana, which showed that the use of newly introduced effective malaria therapies—perceived by the population to be of good quality—was significantly higher among households benefiting from free care (Ansah *et al.* 2009).

These Kangaba findings of under-use of health services when drugs are free but other patients' costs are maintained are similar to findings in contexts where general user fees are in place (Jacobs and Price 2004; James *et al.* 2006; MSF 2008; Palmer and Lagarde 2008). It is only when fees were completely abolished for children under 5 and for pregnant women that utilization increased massively for these groups. The increases for these groups were maintained throughout the study period

(two full years, 2007 and 2008) showing that they were not linked to a first transitory momentum linked to the new strategy (Ridde *et al.* 2011).

These significant increases in utilization after switching to free care have also been documented by other authors (Nabyonga *et al.* 2005; Witter *et al.* 2007; Ridde and Diarra 2009; Witter 2009; Yates 2009; Ridde and Morestin 2011). This paper brings some conclusive evidence that removing all financial barriers for patients at the health centre level contributes to higher utilization of effective and good quality services for confirmed malaria cases, indicating that the removal of all user fees for specific groups is a highly effective strategy to increase coverage for effective malaria treatment.

Other authors have shown that *both* quality and financial access are key to increased use of services and that it is possible to maintain quality after abolition of user fees (Nabyonga *et al.* 2008). In the second phase of the Kangaba project, quality of care has been maintained (similar to the first phase), in combination with an improved access strategy. We therefore estimate the possible role of quality of care and MSF reputation as limited in explaining increased utilization of services observed during the second phase of the project. Nevertheless, a lag effect of improved quality of care and MSF presence from the first phase could still be to some extent a confounding factor towards increased utilization rates during phase II. The following elements indicate that this confounder would play a limited role:

- (i) MSF was already present in the area for more than a year and a half with a supervision team (providing drugs, training staff, working on improved quality of care);
- (ii) This quality care package already existed during the first phase of the project, but led to only modest increases in utilization of services compared with those in phase II of the project, when fees were abolished;
- (iii) A possible lag effect of quality improvements or reputation as a contributing factor to increased use of services before phase II of the project would lead to an increased utilization rate in the groups not targeted by the free care measure (those over 5 years old and not pregnant). In fact, any increases within this group during the second phase of the project have been small compared with those observed within the target groups for free care; the number of confirmed malaria cases treated in the health centres also remained largely below the expected number of adult cases in this context.

These results documenting slight increases in utilization with free malaria diagnostics and drugs, in contrast to significant impact on malaria treatment coverage with a broader free care package, are of particular relevance in the context of Mali. With malaria being one of the most important causes of morbidity and mortality, the current national policy for combating malaria has set ambitious objectives of treatment coverage; for example, 80% treatment coverage for uncomplicated malaria and for children under 5 (MOH 2006). These national objectives are matching international commitments of improving child health (MDG 4) and combating malaria (MDG 6). Effective malaria prophylaxis and treatment in pregnant women also

reduces maternal and perinatal mortality (MDG 4 and 5) (United Nations 2009).

The effectiveness of the current national policy, delivering free diagnostics and drugs only to children under 5, is questionable, as this will be insufficient to achieve the national and international objectives of morbidity and mortality reduction. Providing an essential package of free care for all patients is a possible way forward to ensure better coverage of essential care and malaria-related care; implementation should be addressed by all stakeholders, including health authorities, national and international health actors. This measure to provide care without patient payment should include, in particular, vulnerable patients (children, pregnant women) and/or entire geographic regions prone to malaria-related excess mortality and morbidity. Requiring such measures of abolition of financial barriers for patients as a condition for the allocation of funds could ensure that already available subsidies, such as those for malaria drugs, will effectively reach the patients. In addition, outreach strategies, such as delivery of free malaria treatment through malaria village workers, should be further explored to specifically address geographical barriers to access to malaria care. This could be an efficient strategy—complementary to the provision of free care at health centre level—to contribute to the scaling up of malaria treatment coverage in remote areas.

Impact on mortality

Besides the results related to utilization of care, our findings indicate that in areas where services were underused, mortality was higher. In areas where the MSF intervention led to an increased uptake of essential health services, mortality was found to be reduced within the general and the under-5 population. In these areas, free care was found to be a central contributing factor to the increased uptake of health services, as demonstrated through the successive phases of the project. This confirms previous findings stating that coverage of essential health services is key to better health outcomes (Jones *et al.* 2003; Darmstadt *et al.* 2005; James *et al.* 2005). Again, these findings are of utmost importance for policy makers and health implementers wanting to impact on population health outcomes, such as under the MDGs. Population impact of health-system-based interventions will not be possible without tackling the problem of under-use of essential health services (Unger *et al.* 2006). User fees, as one clearly identified obstacle to timely use of health services, should be addressed as an urgent priority. Other studies need to be carried out to bring more evidence on the specific link between free-of-charge essential care, increased utilization of services and health outcomes at population level. Our findings already indicate that in two areas of a same Circle (region) with similar socio-economic and demographic patterns but different health interventions and access, health outcomes were significantly different. This encouraging finding differs from a recent study that could not prove the impact of free access on health outcomes (Ansah *et al.* 2009).

Resource requirements

As a part of this intervention, MSF subsidized the cost of care at health centre level by paying instead of patients. The cost of care per patient at a health centre was equivalent to an average

of less than 3 EUR per consultation. Despite overall higher total costs, the cost per person treated fell, based on economies of scale. This was possible because of a more optimal use of existing resources, particularly for human resources and operating costs. In Kangaba, although the number of consultations trebled, it was not necessary to hire extra staff proportionally to the increased demand when switching to free care, because before that consultants at health centres were only seeing an average of four patients per day.

Based on project data, estimations of additional funding needed to deliver a free basic package of care for all under-5s beyond the project can be made. Cost calculations in this study include the additional funding needed to cover all expenses to provide this basic package at the level of health centres (including associated outreach strategy). However, we fully recognize that for this to work, regular technical and management support to the health personnel is necessary. Resources to cover the cost of a supervision team, such as at the level of the Circle, will be crucial. The specific running cost of such a supervision team beyond the project still needs to be assessed, based on the national set up and existing supervision mechanisms. Non-governmental organization (NGO) costs would not be a correct basis for this estimation and therefore have not been used. Reinforcing existing national structures would likely cost less compared with the cost of setting up an entirely new NGO supervision team.

Considering this and considering that the national policy already provides for the delivery of free RDTs and ACTs for under-5s, our estimations based on Kangaba example are that the extra funding needed to provide a full package of free care for under-5s at health centre level would amount to 4.2 EUR per child per year. This corresponds to 5.6 EUR per child (as described in Table 3) minus 1.4 EUR (estimated average cost of RDT+ACT per child per year). For the complete Kangaba Circle, covering 100 000 inhabitants with an estimated 20% of them under 5 years of age, this would correspond to a budget of less than 100 000 EUR per year to ensure free care for all under-5s at health centre level. In other words, not more than one additional euro per inhabitant per year would be needed to improve child health (MDG 4) and combat malaria (MDG 6) in the Circle. In practice, the amount needed to roll out free care for all medical conditions for under-5s at national level would represent around 10% of the total state health budget [estimates based on 2010 state health budget forecast (Ministry of Health 2009)]. The additional money needed would be reasonable for the number of children that could be covered and the results that could be achieved. National and international resources, in particular funding for health systems strengthening, could be used to abolish patient fees and contribute to increase health systems' performance and the effectiveness of aid.

For the national level, beyond the amount of money needed to abolish fees, some challenges linked to the functioning of the health system pre-exist. These need to be addressed in order to successfully roll out the abolition of fees and face the consequent increase in use of health services. The three key pillars to any functional health system—the availability of structures, human resources and a functioning drug supply—remain critical when the system is free of charge for patients.

A forecast of the increased demand for health services helps to adjust these three pillars to the increased demand revealed by the abolition of fees (Save the Children 2008).

Based on MSF's experience within the national system in Kangaba Circle, availability of structures/consultation space and staff was not found to be the biggest challenge, as existing health centres and staff are largely underused. However, the reinforcement of the drug supply system and its expansion proved to be very important to cope with the increased amount of drugs needed. Specific attention to drug supply (in financial, logistics and management terms) for remote, decentralized areas is central to the success of user fee abolition measures. This has been observed in other contexts where fees were abolished at national level (Xu *et al.* 2006). Experience in other contexts suggests that provider incentives to compensate for the loss of revenues linked to user fees (Meesen *et al.* 2006) would also be a key factor of success in Mali.

One key feature of the MSF project in this context was the choice to work through the existing system, using the existing health centres, their personnel and channelling the extra support through the ASACOs. Our conclusion is that this support allowed essential care to be made free for patients without weakening the existing health system. On the contrary, subsidizing the health system to provide free care for patients significantly strengthened it, as it rendered it more effective and equitable in assuring effective health interventions for its population. Integration of free care within the existing health system is considered a key process for the success of user fee removal (Ridde and Diarra 2009).

All these results are based on MSF experience in Kangaba. There may be important variations in terms of the availability of health care offered throughout the country that would need to be assessed in order to properly implement such a policy change at national level. However, the findings can serve as a contribution to prepare for such change on a wider scale in Mali.

Experiences from other countries, such as abolition of fees for all under-5s in Niger, may also illustrate some of the challenges when abolishing user fees, but also the options available to avoid potential dysfunctioning of the system (Ridde and Diarra 2009; Ridde and Morestin 2011). These might indicate what key elements need to be carefully considered in the process of any national strategy of user fee removal (Gilson and McIntyre 2005).

Conclusions

A strategy of removing fees for general health services for vulnerable groups enables wider access and coverage of highly effective interventions, such as malaria diagnosis and treatment at health centres. In turn, coverage is crucial to obtain an impact on mortality. Health authorities and donors should integrate this evidence in their policy choices: securing the necessary funds, initiating and supporting processes to increase the population's access are key to improve health outcomes. If international subsidies support health systems that are underused by patients because they are not free, donors should fully realise and bear the responsibility of the limited impact of these funds.

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Conflict of interest

We have no conflict of interest to declare.

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